

KAT500 Firmware Release Notes

02.05 10-11-2021

Accept K4 transceiver frequency messages with 1 kHz resolution via AUXBUS

Accept IF, FA, FB, and FT transceiver TX frequency messages from Elecraft K3S, K3, KX3, Kenwood, Flex, Yaesu FT-450, FTDX3000, FTDX5000, FT-891, FT-991A, FTDX101MP, and FTDX101D. KPA500 and some logging programs poll with these messages.

Add commands: FC; (TX frequency count), FX; (last XCVR or CAT-supplied frequency), and FY; that shows the frequency span for the currently selected ATU memory. An updated KAT500 Utility Program shows these values on the Operate tab.

Add FDT; command to specify the distance, in kHz, between the current ATU frequency and a new TX frequency count for the ATU to retune.

DM; command, without a specified frequency, shows all the stored ATU settings for the currently selected frequency segment (bin)

Add FTNS; command to perform full search tune, but skip saving the result. ATU settings can then be saved with SM; if desired.

Commands FCCS, FCMD, MTA, and MTM are removed or have no effect.

See the updated KAT500 Automatic Antenna Tuner Serial Command Reference for details on new commands FC, FX, FY, FDT, and FTNS.

Revise frequency counter to better track SSB TX count changes

Favor frequencies supplied by command or transceiver over the frequency counter

Align bins to band boundaries. The first 80 meter bin is now 3500-3509 kHz rather than 3481-3500.

01.79 9-2-2018

Interrupt amplifier key line when SWR exceeds a configurable threshold in all ATU modes, including Bypass. SWR Threshold for amplifier key interrupt may be configured high (99:1) to disable this protection mechanism. See KAT500 Utility Help: Configuration, Edit Configuration, SWR Thresholds.

01.75 4-26-2016

When ATU's frequency is set with F, FA, or MT commands, update TX frequency counter from the command rather than waiting for next transmission. Avoids switching to the ATU settings for the old TX count frequency on next TX before the TX frequency is counted.

01.71 2-26-2015

When Memory Recall Tune in Manual and Auto are off, don't retune on band switch frequency count.

Add FCCS (Frequency Count Continuous Sample time) command to influence frequency counter inertia. Lower values cause the KAT500 to more quickly accept a new frequency count, higher values make the KAT500 less willing to move. This is likely to make the most difference in SSB. (FCCS was removed in 2.01)

Use KAT500 command tester: FCCS; to query. FCCS nn; to set. Default is 12 msec.

01.67 3-12-2014

Attempt to avoid early search termination by a transient SWR dip. Pause for exciter fold back recovery and average over more coupler samples when tuner setting is "best so far" or reaches "stop tune" threshold. Tuning speed changes a bit, but sometimes a better tuning solution is found.

Change Icom AH-4 Start to avoid full search tune on each Icom TUNE button press

01.65 3-7-2014

Perform memory recall tune on transition from mode BYP to MAN or AUTO

Bug fix: was releasing ICOM AH-4 key line too early

Speed up some tunes

01.63 2-24-2014

Additional filtering of coupler ADC counts

Reduce time-to-sleep after each transmission

01.58 2-12-2014

Don't interrupt amplifier key on high SWR unless forward power exceeds about 25 watts

Don't use attenuator when forward power is very low

01.57 2-10-2014

Use K3 VFO frequency, if available, to determine memory address to store tune solution

01.56 2-9-2014

Ignore band line changes and AUXBUS frequency messages while transmitting

01.55 2-7-2014

Perform VFO tracking Memory Recall Tunes using K3 frequency, without requiring transmission.

Requires K3 firmware revision 04.82 or later, with K3 CONFIG:KAT3 menu option KAT500Y enabled (tap numeric keypad 1 to toggle) and Memory Recall Tune on QSY enabled in KAT500 Edit Configuration, and band line and AUXBUS lines connected (e.g. KPAK3AUX or E850463 cables).

Add AN0; command to advance to next enabled antenna

01.54 2-3-2014

Improve Tx frequency counter stability

Reduce default amplifier key interrupt SWR threshold from 99 to 3:1

Add a new unlogged "High SWR" fault when SWR exceeds amplifier key interrupt SWR threshold; reset by transmission with lower SWR

Add "CT;" Cancel Tune command

01.42 12-11-2013

Invoke a finer granularity Full Search Tune if tune is repeated within 5 seconds

Add "TP;" query to query tuning status

Keep LEDs on while sleeping

01.41 5-29-2013

Use KAT500 Utility 1.13.4.2 or later for this firmware version.

KAT500 firmware can now be configured to turn off its crystal oscillator when logically powered off or when "idle". This removes a signal at about 28004.5 kHz. See KAT500 Utility Configuration tab, Edit Configuration, Idle Sleep.

This microcontroller "Idle Sleep" capability is initially disabled because some computer programs may require change to add serial port polls to "wake up" the KAT500 before sending commands. See the updated KAT500 Serial Command Programming Reference, SL command, for details.

Add command to control whether KAT500 starts up with power off (PSI0;) or power on (PSI1;) when DC power is initially applied. See KAT500 Utility Configuration tab, Edit Configuration, Initial Power.

Add "Auto Fine Tune" (AFT) command to use smaller inductance steps during coarse search tune. Full search tunes take slightly longer, but are sometimes able to find more matches for high SWR antennas with narrow ranges, particularly on the low bands.

See KAT500 Utility Configuration tab, Edit Configuration, Auto Fine Tune. Alternatively, tap TUNE again within 5 seconds if a match is not found.

Add FA command to initiate Memory Recall Tune

Reduce minimum power required for Memory Recall Tune

01.32 2-22-2013

Add Memory Recall Tune for in-band QSY. When the KAT500 detects drive on a frequency within the same band, but in a different band segment, it will recall settings previously stored for that segment. This feature defaults ON in mode MAN and mode AUTO, but may be disabled via the KAT500 Utility. Select Configuration, Edit Configuration, Tune on QSY. KAT500 Utility version 1.13.2.13 or later is required to access this menu.

Perform Memory Recall Tune on in-band QSY on Tx frequency count in Mode MAN, without regard to SWR.

Perform Memory Recall Tune on in-band QSY on Tx frequency count in Mode AUTO, without regard to VSWR, followed by a Full Search Tune if needed.

Add MTA and MTM commands to permit owner to enable or disable Memory Recall Tune on in-band QSY. See KAT500 serial command reference. KAT500 Utility configuration support for this command is in KAT500 Utility version 1.13.2.13 and later, Configuration Tab, Edit Configuration, Tune on QSY.

Reduce minimum "start tune" power from 7 watts.

Reduce Full Search Tune time when starting on a nearby frequency.

Clear fault on all button presses, antenna change, band change.

Fault when transmit power exceeds 100W with amplifier key line interrupted

Add optional frequency to SM command to permit saving tuner settings without having to transmit on that frequency. See new KAT500 Serial Command Reference for detailed syntax.

Add FLTC; serial command to clear current fault

Issue FT; response when tune completes and exciter tune power is no longer needed.

Add PS; and PS1; serial commands to query and turn on power.

01.18 12-3-2012

Reduce minimum "start tune" power from 10 to 7.5 watts. Some ICOM radios produce just under 10 watts when their TUNE button is pressed. Matches will sometimes improve if higher power (20 watts) is used.

Use "bypassed" if Bypass SWR is better than full search tune result SWR.

Speed up coarse tuning steps.

01.13 11-6-2012

Display last-known SWR in KAT500 Utility after transmission stops

Alter the criteria for rejecting frequency counts introduced by nearby transmitters

01.10 11-4-2012

Deploy the attenuator on each full tune unless power is too high. Disconnect attenuator if we don't have enough VFWD.

Add a short delay after tuning but before releasing the amplifier key interrupt relay to give the amplifier a little time to forget SWR during tuning

01.05 10-31-2012

Reduce tendency to repeatedly auto tune on the same frequency when near the auto tune threshold

Change handling of the configuration option "Amplifier Key Interrupt SWR Threshold". This per-band threshold can be set to 99:1 or larger to defeat this function; it was hot switching some amplifier keying relays unnecessarily.

KPA500 owners may wish to reduce the Amplifier Key Interrupt SWR threshold to a level that inhibits KPA500 high SWR faults. Use the KAT500 Utility Configuration tab, Edit Configuration, VSWR Thresholds, to set this value. The default for this threshold is 99:1.

The "Amplifier Key Interrupt SWR Threshold" is not tested in mode BYPASS.

Significant changes in how the amplifier key line interrupt relay is handled. This was done for amplifiers other than the KPA500 that might be damaged by interrupting the amplifier's T/R relay while RF is present. The default value is chosen to be safe for any amplifier.

Add a new "Amplifier Key Interrupt Power" (AKIP) threshold to allow per-owner control of the KAT500's use of the the amplifier key line interrupt relay. The value you choose depends on your amplifier's ability to hot switch its T/R keying relay.

Some amplifiers (e.g., KPA500) have solid-state switches and are designed to switch the T/R relay at full power. For these amplifiers, an "unlimited" threshold is appropriate. 1500 watts is interpreted as "unlimited", even if the amplifier is incapable of 1500 watts. **KPA500 owners should choose 1500.**

Some amplifiers have relays that should not be switched at high power. Set the threshold to a value that is safe for your amplifier. The factory default for is 30 watts.

Use the KAT500 Utility version 1.12.11.8 or later, Configuration tab, Edit Configuration, Amplifier Key Interrupt Power. Click Help from this dialog for recommended settings.

01.04 10-21-2012

If ring of J3B is held low during startup, ignore it thereafter to prevent continuous tuning. Cycle DC power to recheck.

Cancel full search tune by tapping MODE, ANT, or TUNE button

01.00 10-9-2012

First production firmware version